

BASE LINE STUDY OF BIRD AT COOPER MINING EXPLORATION AREA OF PT BATUTUA KHARISMA PERMAI IN WETAR ISLAND, MALUKU PROVINCE

(Studi Ekologi Dasar Mengenai Burung Pada Areal Eksplorasi Tambang Tembaga PT Batutua Kharisma Permai Di Pulau Wetar, Provinsi Maluku)

JARWADI B. HERNOWO¹⁾

¹⁾ *Laboratory of Wildlife Ecology, Department of Forest Resources Conservation and Ecotourism Faculty of Forestry IPB, PO Box 168 Bogor 16001*

ABSTRAK

Studi ekologi dasar mengenai burung dilakukan di Pulau Wetar selama 2 minggu (Juni 2005) di areal eksplorasi tambang tembaga PT Batutua Kharisma Permai. Studi ini bertujuan untuk mengetahui, keanekaragaman jenis, kelimpahan, penyebaran lokal serta status burung. Metoda pengamatan dilakukan dengan kombinasi antara Transek dan IPA. Analisis keanekaragaman dan keseragaman jenis burung digunakan index diversity Shanon dan Megguran serta komposisi jenis burung dianalisis dengan indek kesamaan komunitas Jaccard, kemudian dilanjutkan dengan analisis dendrogram. Hasil pengamatan menunjukkan bahwa jumlah jenis burung darat yang dapat ditemukan 54 jenis, 14 jenis burung endemik serta 16 jenis burung merupakan jenis yang dilindungi. Hampir keseluruhan jenis burung yang ditemukan berkaitan dengan habitat hutan. Komposisi jenis burung di areal contoh transek tidak terlalu menunjukkan perbedaan yang nyata. Diantara seluruh jenis burung yang ditemukan, 38 jenis burung tersebar di hutan hijau, 34 jenis di hutan pantai, 32 jenis di hutan musim, 8 jenis di hutan ekaliptus dan 17 jenis di hutan tanaman penghijauan

Keyword : Base line study, bird, diversity, Wetar Island

INTRODUCTION

Background

Wetar island is one of the islands in the Wallacea archipelago, in which the type of birds are influenced by Oriental birds and Australian ones. However it is also well-knowned that Wallacean area presents many endemic species. The forested areas of Wetar Island are the major habitats for the terrestrial birds.

PT. Batutua Kharisma Permai (BKP) is an cooper mining project at Wetar island, South West Maluku, with licensed area statement of exploration of ca. 4 400 ha. In developing the property, BKP concern with minimizing negative impacts on the environmental. Consequently, BKP started with a base line study of the project area, which includes the bird aspects.

To developed positive impact on the exploration, the company, focuses its activities not only on the economically profitable activities, but also on ecological related activities. From the beginning of the planning, BPK complies with all regulations in Indonesia such as the biodiversity convention regarding high biodiversity value of the exploration area.

Objective of the Study

The base line study of bird at the exploration area of BKP cooper mining in Wetar island is designed to:

1. obtain information and data related to bird species diversity
2. obtain the local distribution and abundances of birds
3. obtain the bird composition and status

STUDY AREA

The cooper mining area of PT. Batutua Kharisma Permai (BKP) is located at northern part of the island at (7°26'45" - 7°47'00" S and 126°20'245" - 126°36'00" E). The topography of the project area is mostly hilly and mountainous, with very few flat areas. The valley is very steep, and most of the slopes are > 45 %.

The project area is dissected by numerous small streams, such as Lurang, Kuning, Vanua, Wetuk and Koreng river. Additionally, there are several small streams that only have water during the rain. The drainage pattern of the rivers was dendritic. All of the river at BKP flow to the north and join with Banda Sea.

Wetar island belong to dry climate, where conditions are wet for about 4 months (>200 mm rainfall) and dry (<100 mm rainfall) for about 8 months of the year. According to Smith and Ferguson rainfall type classification at the project area falls into E and D. The annual precipitation is around 1027 mm. The dryer months in the project area are June to September. Annual average temperature is 28.2°C and average humidity is around 79%.

The soil at the project area have a sandy loamy texture with reddish color. The soil is crumb and shallow. The soil at the terrain area is alluvial, brown color and the solum is deep. The soil chemistry at project area is classified a fertile soil.

The current vegetation of the exploration area are mostly forest. Forest type of the project area can divided as beach forest, moist forest, monsoon forest and eucalyptus forest. The vegetation at beach forest includes *Hibiscus tilliaceus*, *Guettarda speciosa* and *Terminalia catappa*. Moist forest in the area is influenced by humidity from rivers surrounding the forest. Several species of vegetation grow in the forest, such *Canarium sylvestre*, *Palaquium sp*, *Instia bijuga*, *Mangifera sp* and *Ficus spp*.

At the low land monsoon forest, several characteristic of vegetations occur such as *Tamarindus indica*, *Sterculia foetida*, *Schleichera oleosa*, *Corypha utan* and *Borassus flabelifer*. Many consociations of eucalyptus (*Eucalyptus alba*) occur at hilly area. Besides several type forest as mentioned above, it occur at the project area, re-greening area was planted with *Sesbania grandiflora*, *Acacia mangium*, *Glericedia sepium* and *Leucane glauca*.

MATERIALS AND METHODS

Location and Time

The study was conducted at PT Batutua Kharisma Permai exploration area in Wetar Island, from 16 – 30 June 2005. The observations were focused on the forested area at 4 400 ha wildlife habitat, i.e. low land monsoon forest, beach forest and plantation forest.

Equipment and Materials

Equipment and materials used in this survey: distribution of forest map of BKP area, compass, chronometer, binocular, and field guide to the birds of Wallacea.

Methods

Bird inventory was carried out using transect method combined with IPA count. Five transects (1 – 2.5 km) were established close to the rivers of Lurang, Kuning, Besar, Wetuk and Koreng. The inventory started at 07.00 until 10.00 a.m. The counting of individual numbers was based

on direct visual contact or the bird calls. Additionally, interview with local people was done to find information on bird species at the project area.

Bird Census

Five transects of one kilometer each were set up along riparian in the project area, presenting distinct habitat types within the forested areas. At 200 m intervals along each transect, all bird calls or sightings within 100 m from the observer were recorded over 20 minute periods. This provided a quantitative measure of the relative abundance of species. Daily species lists have been prepared as an indication of the comprehensiveness of the inventory: fewer species will be added as the total list becomes more complete. Tape-recordings of bird calls were also used.

Interviews

Semi-structured interviews with local guides/residents provided information on the local use of wildlife.

Data analysis

Data from the bird censuses were used to calculate the following ecological measures:

Species Diversity Index

The Shannon index (Magurran 1988) describes bird species diversity along the different transects:

$$H = -\sum p_i \ln p_i$$

in which p_i is the number of individuals of species divided by the total number of individuals. Species diversity is influenced by its components Species Richness (number of species in the sample) and Evenness (also called Equitability). The following formula were used to express the Evenness:

$$E = H/H_{\max}$$

in which $H_{\max} = -\log 1/n$ (n = number of species in the sample).

Similarity indices

The Jaccard similarity index (S) (in Mueller-Dombois & Ellenberg 1974) shows the change in species composition among different samples (i.e., along the different transects):

$$S = c / a+b+c$$

in which a and b are numbers of species unique to samples 1 and 2 respectively, and c is species common to both.

The dendrogram method was used to analyze bird composition at each sample plot. This technique described how the relationship between samples plots regarding similarity index.

RESULTS AND DISCUSSION

RESULTS

Species Abundance and Local Distribution

The results showed that the project area held a medium level of bird diversity, but there were relatively

significant numbers on endemic and protected species. There were a total of 59 species of birds, including 16 protected species and 14 endemic species. The results also showed that the distribution of birds was related to the forest types (Table 1).

Table 1. The bird species recorded at forest type of the project area

Bird	Found at Beach Forest (Species)	Found at Moist Forest (Species)	Found at Monsoon Forest (species)	Found at Eucalyptus Forest (Species)	Found at Regreening Area (Species)
Number of species	34	38	32	8	17
Endemic species	9	14	9	4	6
Protected species	13	14	11	5	7

During the two weeks of fieldwork, a total of 54 terrestrial birds species were observed, with many important species to be protected at the project area. Those important birds species were brown booby (*Sula leucogaster*), bornell's eagle (*Hieraaetus fasciatus*), spotted kestrel (*Falco moluccensis*), Australia hobby (*Falco longipenis*), common kingfisher (*Alcedo atthis*), collared kingfisher (*Halcyon chloris*), scared kingfisher (*Halcyon sancta*), northern fantail (*Rhipidura rufiventris*), rufous fantail (*Rhipidura rufifrons*), helmeted friarbird (*Philemon buceroides*), streak-breasted meliphaga (*Meliphaga reticulates*), brown honeyeater (*Lichmera indistincta*), white-tufted honeyeater (*Lichmera squamata*), Black-chested honeyeater (*Lichmera notabilis*), crimson hooded myzomela (*Myzomela kuehni*) and flame breasted sunbird (*Nectarinia solaris*).

Fourteen endemic birds species were observed at the project area such as wetar ground dove (*Gallicolumba hoedtii*), timor black pigeon (*Turacoena modesta*), timor imperial pigeon (*Ducula cinerea*), olive headed lorikeet (*Trichoglossus euteles*), iris lorikeet (*Psitteuteles iris*), olive brawn oriole (*Oriolus melanotis*) wetar figbird (*Sphecotheres hypoleucos*), orange-banded thrush (*Zoothera peronii*), timor blue-flycatcher (*Cyornis hyacinthinus*), fawn-breasted whistler (*Pachycephala reticulata*), streak-breasted meliphaga (*Meliphaga reticulata*), black-chested honeyeater (*Lichmera notabilis*), crimson hooded myzomela (*Myzomela kuehni*) and flame breasted sunbird (*Nectarinia solaris*)

The local distribution of bird at the property correlated with forest types. Most of the terrestrial birds (70.4%) were distributed in the moist forest, but only

(14.8%) in eucalyptus forest. Meanwhile about (31.5 %) of birds species used re-greening area.

Habitat

Beach forest was dominated by vegetation such as *Hibiscus tilliaceus*, *Terminalia cattapa*, *Caloppyllum sp* and *Pongamia pinnata*. This forest occurred along the coast with the width between 25 – 100 m. The forest canopy has 2 – 3 layers. Thirty four species of bird used that forest as their habitat. The species frequently found were barred dove (*Geopelia maugi*), timor black pigeon (*Turacoena modesta*).

Tamarindus indica, *Shleichera oleosa*, *Sterculia foetida*, *Ficus spp* and *Borassus flabelifer* were dominant vegetation in the monsoon forest. Two to three layers of vegetation were present in this forest. Around 32 species of birds were found in this habitat.

Moist forest or evergreen forest occurred at the project area was influenced by rivers surrounding them. Species dominated at the forest were *Canarium sylvestris*, *Pterocarpus indicus*, *Intsia bijuga*, *Syzygium sp*, *Mangifera sp* and *Ficus spp*. Besides many species of trees, abundant species of bird can be found in the moist forest. A total of 38 species of birds were observed in the forest.

Although, the re-greening area is not large 17 species of bird used the forest as part of their habitat.

Bird Species Diversity

The index of bird species diversity between the sample areas did not show great differences, with Lurang transect had the lowest and Koreng the highest (Table 2). In this

case, the diversity index has a positive correlation with equitability index. If the diversity is high the equitability will also high and vice cersa. The important factor the

influenced the diversity is habitat. The diversity of habitat was the main factor in supporting the availability of food resources, cover, shelter and nesting area.

Table 2. Bird species diversity at each transect area

Transect	Diversity index (H)	Equitability index (E)
Lurang	2.345	0.827
Kuning	2.876	0.924
Vanua	2.795	0.893
Wetuk	2.678	0.879
Koreng	2.885	0.945

Bird Composition

The similarity index showed that bird composition at the project area was not much different between the transects. Transect 2 and 3 had the highest similarity in bird composition, while both transects were very different from transect 4 (Figure 1). The dominant guilds were insectivores (42,4 %), piscivores (13,6 %), seed eater (18,7%), frugivores (18,7%) and carnivores (8,6%). The

common birds at the area were barred dove (*Geopelia maugi*), ashy bellied white-eye (*Zosterops citrinellus*), pied bush-chat (*Saxicola caprata*), fantail bird (*Rhipidura rufiventris* and *Rhipidura rufifrons*), fawn breasted whistler (*Pachycephala orpheus*), brawn honeyeater (*Lichmera indistincta*) crimson hooded myzomela (*Myzomela kuehni*) and flame breasted sunbird (*Nectarinia solaris*)

Table 3. The similarity indices (S)of bird between transects

Transect	1	2	3	4	5
1		0.657	0.698	0.572	0.581
2			0.699	0.647	0.625
3				0.674	0.689
4					0.623
5					

Legend

- 1. Transect Lurang and its surrounding
- 2. Transect Kuning and its surrounding
- 3. Transect Vanua and its surrounding
- 4. Transect Wetuk and its surrounding
- 5. Transect Koreng and its surrounding

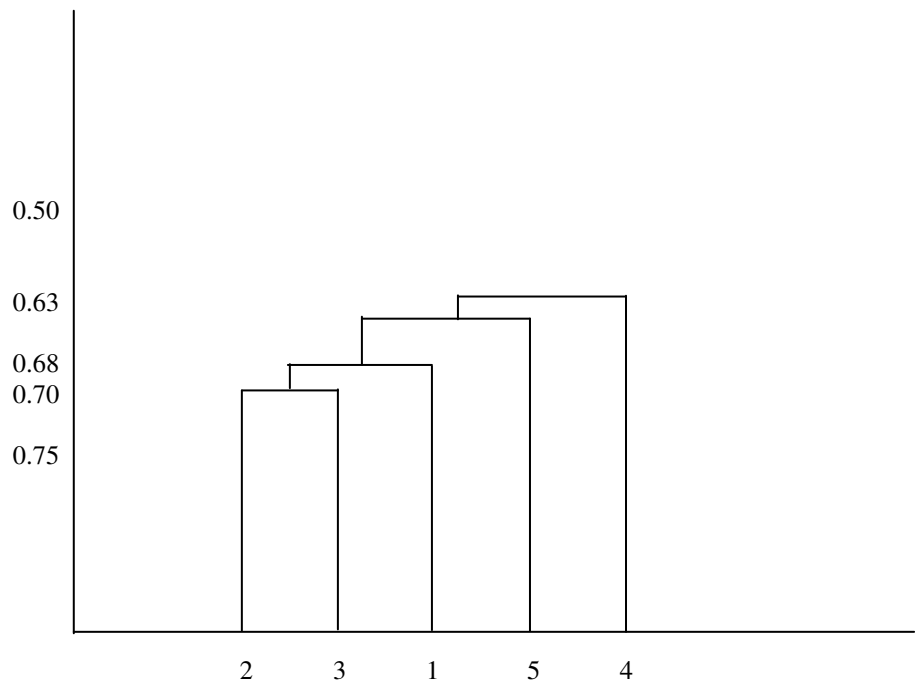


Figure 1. The dendrogram of each transect

DISCUSSION

The endemic species and protected bird found at the property were high (25.9 % and 29,6 %, respectively). This indicates that if the mining project will be developed at the area should be considered to the species and it used as one of criteria success on management of mining environmental.

The bird composition appeared to be closed similar between sample areas (Table3). This might be influenced by the influenced by the supposedly similar habitats found within each transect, i.e. beach forest, monsoon forest, moist forest and eucalyptus forest. The most common, species of bird at the project area was barred dove. The bird was distributed in every sample site with high abundance. It is suggested that the habitats are suitable for this species.

The factors have influenced to bird species diversity in the forest which were high variation of vegetation species, number of forest layer and availability of least disturbed areas. The highest bird diversity was found in the moist forest suggesting that moist forest supported the availability of food resources, cover and shelter also nesting area necessary for birds.

CONCLUSIONS & RECOMMENDATIONS

- 1. The terrestrial bird found at the project area were 54 species which related to forested area. The diversity of bird was categorized medium, but significant at endemic bird species.
- 2. Among the birds found at the project area 16 species were identified as protected birds and 14 endemic birds.
- 3. If the mining project will be developing at the area should be considered to the protected species and endemic species.

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REFERENCE

- BirdLife International (2001). *Threatened Birds of Asia: the BirdLife International Red Data Book*, Cambridge, UK: BirdLife International
- Coated B.J and Bishop K.D 1997. A Guide To The Bird : Birds Of Wallacea, Sulawesi, The Moluccas, Lesser Sunda Island, Indonesia. Dove Publications. Dai Nippon Co Ltd. Hongkong.
- Magurran, A.E. (1988). *Ecological diversity and its measurement*. London & Sydney, Croom Helm.
- Mueller-Dombois, D. & H. Ellenberg (1974). *Aims and methods of vegetation ecology*. New York etc, Wiley.
- White C.M.N and Bruce M.D 1997. The Birds Of Wallacea, Sulawesi, The Moluccas, Lesser Sunda Island, Indonesia. An Annotated Check-List. British Ornithologists Union. Henry Ling Ltd. Dorset

ANEXES

Table 1. The list of birds species found at The PT Batutua Kharisma Permai Project area, Wetar Island, Maluku Province

No	Family/Species	Common Name	Found at Sampling Area						Status	Document
			1	2	3	4	5	6		
	PROCELARIIDAE									
1	<i>Puffinus pacificus</i>	Wedge-tailed Shearwater	-	-	-	-	-	-	NP	Banda see closed to project area, Fv
	FREGATIDAE									
1	<i>Fregata minor</i>	Great Frigate	-	-	-	-	-	-	NP	Cross over Lurang, Fv
	SULIDAE									
1	<i>Sula leucogaster</i>	Brown Booby	-	-	-	-	-	-	P	Banda see closed to project area, Fv
	ACCIPITRIDAE									
1	<i>Hieraaetus fasciatus</i>	Bonelli`s Eagle	√	√	√	?	√		P	MF, EF, C
2	<i>Halieetus leucogaster</i>	White bellied see eagle	-	√	-	-	-		P	BF, Fv
	FALCONIDAE									
1	<i>Falco moluccensis</i>	Spotted kestrel	√	-	-	-	√		P	MF, C
2	<i>Falco longipennis</i>	Australian Hobby	-	-	-	-	√		P	MsF, C
	PHASIANIDAE									
1	<i>Gallus gallus</i>	Red jungle fowl	√	?	?	?	√	√	NP	BF, MF, RG, SF
	GLAREOLIDAE									
1	<i>Siltia isabella</i>	Australian Pranticole	√	-	-	-	-	-	NP	B, Mg, Mo
	LARIDAE									
1	<i>Sterna anaethetus</i>	Bridled Tern	-	-	-	-	-	-	NP,M	Banda see closed to project area, Fv
	COLUMBIDAE									
1	<i>Streptopelia chinensis</i>	Spotted-Dove	√	?	√	?	√	√	NP	MF, RG, SF
2	<i>Macropygia magna</i>	Dusky Cuckoo-Dove			√				NP	MsF, Fr
3	<i>Geopelia maugei</i>	Barred Dove	√	√	√	√	√	√	NP	BF, MF, MsF, EF, RG, SF
4	<i>Chalcophaps indica</i>	Emerald Dove	√	?	√	?	?	√	NP	MsF, BF, SF
5	<i>Gallicolumba hoedtii</i>	Wetar ground Dove	-	-	-	-	√	√	NP, E	MsF, BF, SF
6	<i>Turacoena modesta</i>	Timor black Pigeon	?	√	√	√	√	√	NP, E	BF, MF, MsF, Fr
7	<i>Ptilinopus cinctus</i>	Black-backed Fruit Dove	?	√	?	√	√	√	NP	MF, BF, MsF, Fr
8	<i>Ducula cineracea</i>	Timor Imperial Pigeon	√	?	?	√	√	√	NP, E	MsF, BF, MF, Fr
	PSITTACIDAE									
1	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	?	√	?	√	√	-	NP	EF, MsF, RG,Fr, SF
2	<i>Trichoglossus euteles</i>	Olive Headed Lorikeet	√	-	√	√	√	√	NP, E	EF, MsF, Fr, SF
3	<i>Psitteuteles iris</i>	Iris Lorikeet	-	?	?	-	√	-	NP, E	MsF, Fr
4	<i>Geoffroyus geoffroyi</i>	Red-cheeked Parrot	?	√	?	√	√	?	NP	EF, MsF, Fr, SF
5	<i>Tanygnathus megalorynchos</i>	Great-billed Parrot	-	?	√	?	√	√	NP	BF, MsF, RG,Fr, SF
	CUCULIDAE									
1	<i>Centropus bengalensis</i>	Lesser Coucal	√	-	-	-	-	-	NP	Bs, I

	STRIGIDAE									
1	<i>Ninox scutulata</i>	Brown Boobook	-	-	-	-	-	√	NP	MF, I
	CAPRIMULGIDAE									
1	<i>Caprimulgus macrurus</i>	Large tailed Nightjar	?	-	-	-	-	√	NP	BF,I
	APODIDAE									
1	<i>Collocalia esculenta</i>	Glossy Swiftlet	√	?	√	?	√	?	NP	MF, MsF, I
	ALCEDINIDAE									
1	<i>Alcedo atthis</i>	Common Kingfisher	√	?	√	√	?	-	P	BF, MsF, RF, Fv
2	<i>Halcyon chloris</i>	Collared Kingfisher	√	√	√	√	√	√	P	BF, MsF, RF, Fv
3	<i>Halcyon sancta</i>	Scared Kingfisher	√	√	√	√	?	√	P	BF,MsF, RF, Fv
	MEROPIDAE									
1	<i>Merops ornatus</i>	Rainbow Bee-eater	?	√	√	?	√	√	NP	MF, I
	CAMPEPHAGIDAE									
1	<i>Coracina novaehollandiae</i>	Black faced Cuckoo-shrike	√	√	√	√	√	√	NP	BF, MsF, MF, I
2	<i>Lalage sueurii</i>	White shouldered Triller	-	-	-	-	√	?	NP	MsF, I
	DICRURIDAE									
1	<i>Dicrurus densus</i>	Wallacean Drongo	?	?	√	√	√	√	NP	BF, MF, MsF, I
	ORIOLIDAE									
1	<i>Oriolus melanotis</i>	Olive brawn Oriole	-	-	-	-	√	√	NP, E	MsF, BF, Fr
2	<i>Sphecotheres hypoleucos</i>	Wetar Figbird	-	-	-	-	√	?	NP, E	MsF, Fr
	CORVIDAE									
1	<i>Corvus macrorhynchos</i>	Large billed Crow	√	√	√	√	√	√	NP	BF, MF, O
	TURDIDAE									
1	<i>Zoothera peronii</i>	Orange-banded Thrush	√	√	√	√	√	√	NP, E	BF, MF, MsF, RG, I
2	<i>Saxicola caprata</i>	Pied Bush –chat	√	√	√	√	√	√	NP	BF, MF, MsF, RG, I
	MUSCICAPIDAE									
1	<i>Cyornis hyacinthinus</i>	Timor blue-flycatcher	?	√	√	√	√	√	NP, E	BF, MF, MsF, RG, I
2	<i>Rhipidura rufiventris</i>	Northern Fantail	√	√	√	√	√	√	P	BF, MF, MsF, RG, I
3	<i>Rhipidura rufifrons</i>	Rufous Fantail	√	√	√	√	√	√	P	BF, MF, MsF, RG, I
	PACHYCEPHALIDAE									
1	<i>Pachycephala pectoralis</i>	Common golden Whistler	?	√	?	√	√	√	NP	BF, MF, MsF, RG, I
2	<i>Pachycephala orpheus</i>	Fawn-breasted Whistler	√	√	√	√	√	√	NP, E	BF, MF, MsF, RG, I
	ARTAMIDAE									
1	<i>Artamus leucorhynchos</i>	White-breasted Wood-Swallow	√	-	-	-	√	-	NP	MF, I
	LANIIDAE									
1	<i>Lanius shach</i>	Long-tailed Shrike	?	√	?	?	√	√	NP	MF, I
	STURNIDAE									
1	<i>Aplonis minor</i>	Short-tailed Starling	√	-	-	-	?	√	NP	BF, Fr
	MELIPHAGIDAE									
1	<i>Philemon buceroides</i>	Helmeted Friarbird	√	√	√	?	√	√	P	BF, MF, MsF, RG, HS,I
2	<i>Meliphaga reticulata</i>	Streak-breasted Meliphaga	?	√	?	√	√	?	P, E	BF, MF, MsF, HS,I
3	<i>Lichmera indistincta</i>	Brown Honeyeater	√	√	√	√	√	√	P	BF, MF, MsF, RG, EF, HS,I
4	<i>Lichmera squamata</i>	White-tufted Honeyeater	-	-	√	?	√	√	P	BF, MF, MsF, HS, I

5	<i>Lichmera notabilis</i>	Black-chested Honeyeater	?	√	?	√	√	√	P, E	BF, MF, MsF, RG, EF, HS, I
6	<i>Myzomela kuehni</i>	Crimson hooded Myzomela	√	√	√	√	√	√	P, E	BF, MF, MsF, RG,EF,HS, I
	NECTARINIIDAE									
1	<i>Nectarinia solaris</i>	Flame breasted Sunbird	√	√	√	√	√	√	P, E	BF, MF, MsF, RG, EF, HS, I
	DICAEDAE									
1	<i>Dicaeum maugi</i>	Red-chested Flowerpecker	?	√	?	?	√	√	NP	BF, Fr, I
	ZOSTEROPIDAE									
1	<i>Zosterops citrinellus</i>	Ashy-bellied White-eye	√	√	√	√	√	√	NP	BF, MF, MsF, RG, I
	PLOCEIDAE									
1	<i>Taenopygia guttata</i>	Zebra Finch	-	?	√	-	-	-	NP	Bs, SF
2	<i>Lonchura punctulata</i>	Scally breasted Munia	√	-	√	-	-	?	NP	Bs, SF
3	<i>Lonchura pallida</i>	Pale-headed Munia	√	√	√	√	√	√	NP	BF, MF, MsF, SF

Legend

1. Transect Lurang and its surrounding

2. Transect Kuning and its surrounding

3. Transect Vanua and its surrounding

4. Transect Wetuk and its surrounding

5. Transect Koreng and its surrounding

6. Base camp and its surrounding

√ = present

? = may be present but not recorded during observation

NP = not protected species

P = protected species
- MF = Monsoon Forest

BF = Beach Forest

MsF = Moist Forest

EF = Eucalyptus Forest

Fv = Fishivorous

C = Carnivorous

I = Insectivorous

O = Omnivorous
- SF = Seed Feeder

RG = Re greening Area

Mo = Mollusk

Fr = Frugivorous

E = Endemic

Bs = Bush and shrub

RF = Riparian Forest

Mg = Mangrove

HS = Honey sucker

Appendix 2. Selected Species List

In the following account species are listed have a globally threatened status: vulnerable and near-threatened (BirdLife International 2001).

Bonell's Eagle *Hieraaetus fasciatus*

Global status – Vulnerable (BirdLife International 2001). Field notes – A famili bird (3 birds) and many single bird were seen fly uphill Lurang, Vanua river and Koreng river on 18 June 2005, 21 June 2005, and 23 June 2005.

White bellied - See Eagle *Haliaeetus leucogaster*

Global status – Vulnerable (BirdLife International 2001).Field notes – young and adult birds flew in and above the beach forest at Vanua.

Australian Hobby *Falco longipennis*

Global status – Vulnerable (BirdLife International 2001). Field notes – uncommon, but widespread, flying over the forest. On 20 June 2005 at Koreng.

Spotted Kestrel *Falco moluccensis*

Global status – Near-threatened (BirdLife International 2001). Field notes – A single bird crossing the Lurang village on 18 June 2005 and the bird perched on dead tree at Koreng riverbank on 23 June 2005.

Dusky Cuckoo-Dove *Macropygia magna*

Global status –Endemic at small island at Sulawesi, 4 subspecies (*magna*) for Wetar.. Field notes – On 20 June 2005 a single bird crossing the Kuning river.

Timor Black Pigeon *Turacoena modesta*

Global status – Endemic to Wetar. Field notes – common at low land forest.Widespread in beach forest, monsoon forest and moist forest .

Barred Dove *Geopelia maugi*

Global status – Commonest bird species. Field notes – Widespread over all forest type in concession project area.

Wetar Ground-dove *Gallicolumba hoedtii*

Global status – Endemic to Wetar. Field notes – Few recorded, on 22 June 2005 a single bird crossing camp and 23 June 2005 flying at moist Forest Koreng river hill.

Timor Imperial Pigeon *Ducula cineracea*

Global status – Endemic to Wetar. Field notes – uncommon, but widespread, flying over the beach forest,monsoon forest and moist forest.

Olive-Headed Lorikeet *Trichoglossus euteles*

Global status - Endemic to Wetar. Field notes – Locally common, widespread, flying over the eucalyptus forest, monsoon forest and moist forest.

Iris Lorikeet *Trichoglossus iris*

Global status - Endemic to Wetar. Field notes –uncommon, a small group birds (3 birds) flying over the moist forest at koreng river hill on 23 June 2005.

Timor Oriole *Oriolus melanotis*

Global status – Endemic to Wetar. Field notes –uncommon, a single bird sing at moist forest on 23 June 2005 koreng river hill and 22 June 2005 at near camp.

Wetar Figbird *Sphecotheres hypoleucos*

Global status –Endemic to Wetar. Field notes – uncommon, a single bird seen feed on Ficus tree at moist forest.

Orange Banded Thrush *Zoothera peronii*

Global status –Endemic to NTT. Field notes – locally common, Widespread a solitary bird at beach forest, moist forest and monsoon forest.

Timor Blue Flycatcher *Cyornis hyacinthinus*

Global status –Endemic to NTT. Field notes – uncommon, Widespread a solitary bird at beach forest, moist forest and monsoon forest.

Northern Fantail *Rhipidura rufiventris*

Global status – Near-threatened (BirdLife International 2001). Field notes - Widespread and not uncommon in the lower parts of the project area.

Rufous Fantail *Rhipidura rufifrons*

Global status – Near-threatened (BirdLife International 2001). Field notes – Widespread and common, a solitary bird.

Fawn-breasted Whistler *Pachycephala orpheus*

Global status - Endemic to NTT. Field notes – common, Widespread at beach forest, moist forest and monsoon forest.

Helmeted Friarbird *Philemon buceroides*

Global status – Near-threatened (BirdLife International 2001) Field notes – common, Widespread over all forest, include regreening area.

Streak-breasted Meliphaga *Meliphaga reticulata*

Global status – Endemic to Wetar. Near-threatened (BirdLife International 2001); Field notes, common, widespread in small numbers.

Black-chested Honeyeater *Lichmera notabilis*

Global status – Endemic to Wetar. Near-threatened (BirdLife International 2001); Field notes –common,Widespread in the area.

Crimson-hooded Myzomela *Myzomela kuehni*

Global status – Endemic to Wetar,Restricted range species. Field notes – Rather common in the project area.

Flame-breasted sunbird *Nectarinia solaris*

Endemic to Wetar Near-threatened (BirdLife International 2001). Field notes – not uncommon, Widespread in the area.